

IN THE CLAIMS

Please amend the claims to read as indicated below:

1. (currently amended) A method of defragmenting file allocations on a disk, the method comprising:

determining ~~what pages should to~~ be swapped among the various allocations made by an operating system (OS);

swapping determined pages by performing a step from a group of steps consisting of:
a) manipulating data structures so as to indicate swapping of pages without actually swapping data between physical locations on a medium; and b) moving data on a medium where OS visible data is read and written;

updating an OS the file system mapping of the OS updated to reflect the swapped pages; and ~~and a history of the an original state prior to any recorded update;~~ recorded by an engine;

logging indications of the swapped pages so that an image of the OS visible data prior to the swapping can be reconstructed, without requiring that each read operation and each write operation be written to a history log, wherein the swaps performed by manipulation of the data structures of the engine and/or actually exchanging data on the disk where OS visible data is read and written but by knowing what data to effectively re-swap and what OS mapping data to effectively restore, the original state of each altered page is not directly recorded in a historic log, but instead, a record is additionally logged of the locations of the swapped data so that an image of the OS visible data can be reconstructed prior to the time of

~~the defragmentation by knowing what data to effectively re-swap and what OS mapping data to effectively restore.~~

2. (currently amended) The A method of ~~according to~~ claim 1, wherein the method is performed on a computer wherein a history of data is maintained such that the computer can be returned to a state of data from an earlier point in time.

3. (currently amended) The A method of ~~defragmenting file allocations on a disk according to~~ claim 1, further comprising:

~~including the step of~~ incorporating desired close proximity information of various OS visible pages into an algorithm executed by ~~the~~ an engine that determines ~~what is actually~~ pages to be swapped, in order to reasonably ~~reasonable~~ maintain ~~physical~~ close physical proximity of data allocated by the OS but physically re-mapped by the engine.

4. (currently amended) The A method of ~~according to~~ claim 3, wherein the method is performed on a computer wherein a history of data is maintained such that the computer can be returned to a state of data from an earlier point in time.

5-8. (cancelled)

9. (original) A method according to claim 4, wherein the historical data is maintained by diverting writes to a different position on the disk so historical data remains in its original location.

10. (new) A computer readable medium containing a computer program product for defragmenting file allocations on a disk, the computer program product comprising:

program code for determining pages to be swapped among various allocations made by an operating system (OS);

program code for swapping determined pages by performing a step from a group of steps consisting of: a) manipulating data structures so as to indicate swapping of pages without actually swapping data between physical locations on a medium; and b) moving data on a medium where OS visible data is read and written;

program code for updating an OS file system mapping to reflect the swapped pages;
and

program code for logging indications of the swapped pages so that an image of the OS visible data prior to the swapping can be reconstructed, without requiring that each read operation and each write operation be written to a history log.

11. (new) The computer program product of claim 10, further comprising:

program code for maintaining a history of data executes, such that a computer can be returned to a state of data from an earlier point in time.

12. (new) The computer program product of claim 10, further comprising:

program code for incorporating desired close proximity information of various OS visible pages into an algorithm executed by an engine that determines pages to be swapped, in order to reasonably maintain close physical proximity of data allocated by the OS but physically re-mapped by the engine.

13. (new) The computer program product of claim 12, further comprising:

program code for maintaining a history of data executes, such that a computer can be returned to a state of data from an earlier point in time.

14. (new) The computer program product of claim 13 further comprising program code for maintaining the historical data by diverting writes to a different position on the disk so historical data remains in its original location.

15. (new) A computer system for defragmenting file allocations on a disk, the computer system comprising:

- a software portion configured to determine pages to be swapped among various allocations made by an operating system (OS);

- a software portion configured to swap determined pages by performing a step from a group of steps consisting of: a) manipulating data structures so as to indicate swapping of pages without actually swapping data between physical locations on a medium; and b) moving data on a medium where OS visible data is read and written;

- a software portion configured to update an OS file system mapping to reflect the swapped pages; and

- a software portion configured to log indications of the swapped pages so that an image of the OS visible data prior to the swapping can be reconstructed, without requiring that each read operation and each write operation be written to a history log.

16. (new) The computer system of claim 15, further comprising:

- a computer on which a software portion configured to maintain a history of data executes, such that the computer can be returned to a state of data from an earlier point in time.

17. (new) The computer system of claim 15, further comprising:

a software portion configured to incorporate desired close proximity information of various OS visible pages into an algorithm executed by an engine that determines pages to be swapped, in order to reasonably maintain close physical proximity of data allocated by the OS but physically re-mapped by the engine.

18. (new) The computer system of claim 17, further comprising:

a computer on which a software portion configured to maintain a history of data executes, such that the computer can be returned to a state of data from an earlier point in time.

19. (new) The system of claim 18 further comprising a software portion configured to maintain the historical data by diverting writes to a different position on the disk so historical data remains in its original location.